BOOKS RECEIVED.

A MANUAL OF ZOOLOGY for the use of students, with a general introduction on the principles of Zoology—by HENRY ALLEYNE NICHOLSON, M. D., D. Sc., Ph. D., etc., Professor of Natural History in the University of St. Andrews. Sixth edition, revised and enlarged,. William Blackwood and Sons—Edinburgh and London, 1880.

This Manual of Zoology has become so fully recognized as one of the most complete and reliable guides to a knowledge of this subject, that but few words are necessary in giving notice of the issue of a new edition.

The study of Zoology is constantly bringing new and interesting facts to the surface, hence the necessity for frequent editions of manuals treating on the subject, to keep pace with discoveries. Professor Nicholson has availed himself of the present opportunity to thoroughly revise his work, and bring forward arrears of facts which have accumulated during the past two years, and in accordance with the views of many distinguished naturalists he has raised the order of *Echinodermata* to the rank of a sub-kingdom. This alteration necessitates the abandonment of the *Annuloïda* as a sub-kingdom, and the reference of the Scolecida to the Annulosa.

Professor Nicholson forestalls criticism for such action by candidly admitting that this arrangement is far from being wholly satisfactory, but asks that it may be provisionally adopted as the best under the circumstances, taking into account our present knowledge.

A number of excellent illustrations have been introduced in the present edition, and the student will now have the benefit of over 450 wood-cuts.

The general plan of this book is admirable, and following each chapter is a list of the best works and memoirs relating to the animals belonging to each sub-kingdom.

There is one feature of this work which in our opinion gives it a special value to students, and that is an excellent glossary of about 1000 words. The index is also ample and carefully arranged.

The present work of Professor Nicholson is the latest and best Manual of Zoology, and we recomend it strongly to those interested in such studies.

LIFE ON THE SEASHORE, OR ANIMALS OF OUR COASTS AND BAYS, with illustrations and descriptions. By JAMES H. EMERTON, author of Structure and Habits of Spiders. Naturalists' Handy Series No. 1. George A. Bates, Salem, Mass., 1880.

This charming little work is the first of a series of handy books suitable for amateur naturalists, a class now happily on the increase.

The author has provided a pleasant companion which should be in the hands of all visitors to our coasts, ensuring a never failing fund of amusement, leading insensibly to one of the most delightful of scientific studies.

Mr. Emerton states "I have tried to give such explanations of some of our common animals of the New England coast as have been often asked for by persons little acquainted with zoology, and to give such directions about collecting and observing them as have been found useful to students who come to the shore for a short time in the summer to study animals that they before knew only from pictures."

The book is divided into four parts, treating separately animals which are found "between the tides," "near low water mark," "surface animals," "bottom animals." The reader will find this an excellent arrangement. We find above one hundred and fifty excellent wood cuts, which faithfully represent the objects described in the body of the book; the sensational and misleading illustrations to be found in a somewhat similar work find no place in this volume. We can therefore recommend Mr. Emerton's work as not only a reliable guide, but one which will create a healthful desire for knowledge in those who are so fortunate as to possess it.

CHEMICAL NOTES.

CONTRIBUTION TO A KNOWLEDGE OF SAPONIFICATION OF FATS.—The name fat is generally applied to a mixture of the tri-glycerides of palmitic, stearic, and oleic acids. As regards the animal fats this assumption has been in all cases verified, but the vegetable fats display certain not un important deviations. J. König, J. Kiesow, and B. Aronheim, in saponifying vegetable fats, obtained invariably less glycerine than is required for forming the glycerine-ethers of the fatty acids—a fact pointing to the conclusion that free fatty acids must be present, since the quantity of cholesterine occurring in the plants is too small to combine with the fatty acids. For saponification potassium and sodium hydrate were used along with the other basic oxides, the latter substances being considered equal in value to the former, the only difference being that the products in the one case are termed "soaps," and in the other "plasters." It was assumed hitherto that the tri-glycerides, like other ethers, were completely decomposed by the above named ethers into salts of the fatty acids and glycerine, and that equal quantities of glycerine were obtained in all cases. For the saponification of fats and the separation of the products, J. König had proposed a process which consists essentially in treating the fat operated upon with an excess of lead oxide in presence of water at 90° to 100°. Dr. von der Becke, when attempting at his request to saponify cacao-butter in this manner—in order to discover a process for detecting the sophistications of this product—found that it could not be saponified with lead oxide, at least not in this manner. It was found on further experimentation that the quantity of glycerine obtained on saponification with potassium hydrate was in all cases considerably the highest. In the easily saponifiable fats, butter, lard, and olive oil, the difference was found less manifest, but it was much more distinct in those which are hard to saponify. Cacao-butter and tallow, if saponified with lead oxide, yield scarcely traces of glycerine. A mixture of an easily saponifiable fat like butter with cacao-butter gave the same quantity of glycerine as if butter alone were employed. It is possible that the reaction when once set up may extend itself. Hence it appears that in the case of some fats the method of saponification with oxide is not trustworthy, and that when the accurate determination of the proportion of glycerine in a fat is required, the saponification must be effected with potassium hydrate.

CONTRIBUTIONS TO THE CHARACTERISTICS OF THE ALKALINE EARTHS AND OF ZINC OXIDE.—The alkaline earths and zinc oxide if their hydrates, carbonates, and nitrates are heated to complete decomposition, are obtained in the following specific gravities. Lime is obtained amorphous from the hydrate and carbonate, but in regular cubic crystals from the nitrate; in either case of the sp. gr. 3.25. Strontia is obtained from the hydrate and carbonate amorphous, and of sp. gr. 4.5, but from the nitrate in regular crystals and of sp. gr. 4.75. Baryta is obtained from the hydrate in optically one- or two-axial crystals, of sp. gr. 5.32: but from the nitrate in regularly cubic crystals of sp. gr. 5.72. Magnesia is always obtained in the amorphous form of sp. gr. 3.42. Zinc oxide is obtained amorphous from the hydrate and carbonate of sp. gr. 3.47, but from the nitrate in hexagonal pyramids of sp. gr. 5.78.

Prof. Pritchett, of the Morrison Observatory, Glasgow, Mo., has made arrangements to drop a Time-Ball at Kansas City.

DETERMINATION OF SILICON IN IRON AND STEEL.—One grm. iron or steel is placed in a porcelain crucible with 25 c.c. nitric acid of 1.2 sp. gr. When the reaction is over 25 to 30 c.c. dilute sulphuric acid—1 part acid and 3 water are added, and the solution is heated till the nitric acid is entirely or nearly expelled. When the residue is sufficiently cool water is cautiously added, and the contents of the capsule are heated till the crystals are perfectly dissolved. The solution is then filtered as hot as possible, and the residue washed first with hot water, then with 25 to 30 c.c. hydrochloric acid of sp. gr. 1.20, and finally again with hot water. After drying and ignition the silica is obtained snow-white and granular.—T. M. BROWN.